Handicapping Labio-Lingual Deviations Index

Procedure & Method Information

Name of Procedure/Method   Handicapping Labio-Lingual Deviations Index   *Abbreviation*   HLD

Purpose   To assess the presence or absence and the degree of physically handicapping orthodontic conditions.

Year of Establishment   1960   *Type of Procedure/Method*

Developer(s)   H.L. Draker   *Oral Condition Category*

Background Information

Background Information

The Handicapping Labio-Lingual Deviations (HLD) Index was introduced by H.L. Draker in 1960 to identify the presence or absence and the degree of the physical dento-facial handicap based on seven components, and not to diagnose malocclusion (Draker, 1960). These seven components are cleft palate, traumatic deviation, overjet, overbite including reverse overbite, mandibular protrusion, open bite, and labio-lingual spread.

The HLD Index received considerable public health use in the 1960s and 1970s for assessing treatment needs when a public orthodontic program was initiated by the state of New York (Burt and Eklund, 1999). Today, with modifications, the HLD Index has also been adopted by a number of states such as California and Maryland to determine eligibility for public (i.e., Medicaid and Champus) funding of orthodontic treatment (Parker, 1998; Han and Davidson, 2001). For further information on published modifications, please refer to "Established Modifications" under "Procedure Method."

The HLD Index is considered to be a simple, objective, valid, and reliable index that can be applied to both patients and diagnostic study models without the need for special equipment (Draker, 1960; Younis, Vig, Rinchuse, and Weyant, 1997).

Changes Over Time

Besides the modifications referred to above, there have been no changes to the HLD Index established in 1960. However, during the initial development and testing, the HLD Index included two additional components, ectopic eruptions and anterior crowding. But, it was suggested that the labio-lingual spread was the more objective and intended measure so these two components were dropped (Draker, 1960). In addition, as illustrated in the score sheet below, the components of the HLD Index were initially weighted. However, it was felt that a weighting scale of greater accuracy could be obtained via statistical calculations, so the measurements were recorded unweighted and the score sheet was abandoned (Draker, 1960).

Score Sheet

PRINT

Patient's name:
Examiner:
Recorder:

Conditions Observed

1. Cleft palate

Score 15 _____

2. Severe traumatic deviations

Score 15 _____

3. Overjet in mm.

_____

4. Overbite in mm.

_____

5. Mandibular protrusion in mm.

x5 _____

6. Open bite in mm.

x4 _____

7. Ectopic eruption, anterior only, each tooth

x3 _____

8. Anterior crowding: maxilla: ___   mandible: ___

Score 5 ea. _____

9. Labio-lingual spread in mm.

_____

TOTAL HLD SCORE   _____

A SCORE OF 13 (tentative) and over constitutes a PHYSICAL HANDICAP.

Source: Draker HL. Handicapping Labio-Lingual Deviations: A proposed index for public health purposes. Am J Orthodontics 1960;46:295-305.

Procedure Method

Procedure Method

To determine the HLD Index, the teeth are positioned in centric occlusion. A Boley gauge scaled in millimeters (mm) is used by a trained examiner for all measurements (i.e., overjet, overbite including reverse overbite, mandibular protrusion, open bite, and labio-lingual spread), and each measurement is rounded off to the nearest millimeter.

The overjet measurement applies to a protruding single tooth, as well as the whole dental arch. For the overbite measurement, it is recommended that a pencil be used to mark the tooth indicating the extent of overlap to facilitate the measurement. The mandibular protrusion is measured from the labial surface of the lower incisor to the labial surface of the upper incisor. The open bite (i.e., absence of occlusal contact in the anterior region) is measured from edge to edge, and it is advised the open bite be estimated for cases of pronounced protrusion when the measurement is not possible. For the labio-lingual spread, the measurement is made from the

incisal edge of the mandibular left cuspid to the incisal edge of the lingually locked lateral incisor. When there is a protruded or lingually displaced anterior, the measurement is made from the incisal edge of that tooth to the normal arch line (Draker, 1960). In instances of multiple anterior crowding, all deviations from the normal arch should be measured for the labio-lingual spread; however, only the most severe measurement should be recorded for the HLD Index.

For an individual HDL Index, the examiner records whether each of the seven conditions--cleft palate, traumatic deviation, overjet, overbite including reverse overbite, mandibular protrusion, open bite, and labio-lingual spread--is present or absent, whether the dentition is mixed, and the clinical decision (i.e., approval or disapproval). The codes for the HLD Index are as follows:

0 = Condition absent
X = Condition present
M = Mixed dentition (to be indicated if present)
A = Clinical approval
D = Clinical disapproval

Source: Draker HL. Handicapping Labio-Lingual Deviations: A proposed index for public health purposes. Am J Orthodontics 1960;46:295-305.

In screenings or epidemiological surveys, it is essential that two teams or operators be used, one for the measurements and the other for the clinical decision. It is also required that the clinical teams/operators record their decisions independently and apart from the team/operator that takes the HLD Index measurements (Draker, 1960).

Established Modifications   Modifications to the HLD Index include the California Modification of the Handicapping Labio-Lingual Deviations [HLD(CalMod)] Index and the Maryland Modification of the Handicapping Labio-Lingual Deviations [HLD(Md)] Index.

In 1998, the HLD(CalMod) Index was established due several lawsuits brought against the state of California on the issue of providing orthodontic treatment to persons with medically necessary handicapping malocclusions. The HLD(CalMod) Index incorporates the presence or absence of two additional conditions, a deep impinging overbite when the lower incisors are destroying the soft tissue of the palate and the crossbite of individual anterior teeth when the destruction of soft tissue is present. In addition, the presence or absence of an overjet greater than 9 mm or a reverse overjet greater than 3.5 mm was added. A unilateral posterior crossbite involving two or more adjacent teeth in which one must be a molar was also included as a weighted condition. It also reinstated the inclusion and weighting of ectopic eruption and anterior crowding and the usage of the score sheet as utilized during the development and testing of the original HLD Index.

The HLD(CalMod) Index requires a Boley gauge or disposable ruler and is administered to persons at least 13 years of age. For further information on the HLD(CalMod) Index, please refer to the following score sheet, scoring instructions, and guidelines.

California Modification Handicapping Labio-Lingual Deviations [HLD(CalMod)] Index

Provider: Patient:

Dental, Oral and Craniofacial Data Resource Center

Number: SSAN:

Procedure:

  - Position the patient's teeth in centric occlusion.
  - Record all measurements in the order given and round off to the nearest millimeter (mm).
  - ENTER SCORE "0" IF CONDITION IS ABSENT.
  - If anterior crowding and an ectopic eruption are present in the anterior portion of the mouth, score only the
    most severe condition.
  - The use of a recorder (hygienist, assistant) is recommended.

Conditions:

1.   Cleft palate deformities (Indicate an "X" if present and score no further)

_____

2.   Deep impinging overbite WHEN LOWER INCISORS ARE DESTROYING
     THE SOFT TISSUE OF THE PALATE (Indicate an "X" if present and
      score no further)

_____

3.   Crossbite of individual anterior teeth WHEN DESTRUCTION OF SOFT
     TISSUE IS PRESENT (Indicate an "X" if present and score no
     further)

_____

4.   Severe traumatic deviations (Attach description of condition. For example, loss
     of a premaxilla segment by burns or by accident; the result of osteomyelitis; or
     other gross pathology.) (Indicate an "X" if present and score no further)

_____

5A. Overjet greater than 9 mm with incompetent lips or reverse overjet greater than
     3.5 mm with reported masticatory and speech difficulties (Indicate an "X" if present
     and score no further) If reverse overjet is not greater than 3.5 mm, score under #7.

_____

5B. Overjet in mm

_____

6.   Overbite in mm, including reverse overbite

_____
7. Mandibular protrusion in mm

                                                 x5

_____
8. Open bite in mm

                                                 x4

_____

IF BOTH ANTERIOR CROWDING AND ECTOPIC ERUPTION ARE PRESENT IN THE ANTERIOR PORTION OF THE MOUTH, SCORE ONLY THE MOST SEVERE CONDITION. DO NOT SCORE BOTH CONDITIONS.

9. Ectopic eruption: Count each tooth, excluding 3rd molars

                                                 x3

_____

10. Anterior crowding: Score one point for MAXILLA and/or one point for MANDIBLE; two points maximum for anterior crowding. Arch length insufficiency must exceed 3.5 mm. Mild rotations that may react favorably to stripping or mild expansion are not to be scored as crowded.

                                               x5

_____
11. Labio-lingual spread in mm.

_____

12. Posterior unilateral crossbite (must involve two or more adjacent teeth, one of which must be a molar)

                                           Score 4

_____

                                  TOTAL HLD(CalMod) SCORE

_____

IF A BENEFICIARY DOES NOT SCORE 26 OR ABOVE, HE/SHE MAY BE ELIGIBLE UNDER THE EPSDT EXCEPTION, IF MEDICAL NECESSITY IS DOCUMENTED.

_____

EPSDT EXCEPTION: Indicate with an "X" and attach medical evidence and appropriate documentation for each of the following eight areas:

a) Principal diagnosis and significant associated diagnosis; and
b) Prognosis; and
c) Date of onset of the illness or condition, etiology if known; and
d) Clinical significance or functional impairment caused by the illness or condition; and
e) Specific types of services to be rendered by each discipline associated with the total treatment plan; and

f) The therapeutic goals to be achieved by each discipline, and anticipated time for achievement of goals; and

g) The extent to which health care services have been previously provided to address the illness or condition, and
    results demonstrated by prior care; and

h) Any other documentation available which may assist the Department in making the required determinations.

Source: Parker WS. The HLD (CalMod) index and the index question. Am J Orthod Dentofacial Orthop. 1998 Aug;114(2):134-41.

HLD(CalMod) Index Guidelines

1. In cases with deep impinging bites with tissue destruction, the lower teeth must be clearly touching the palate and
    show tissue indentation(s) on the study models or other evidence of soft tissue destruction visible on the study
    models.

2. Either of the upper central incisors is to be used when measuring overjet, overbite including reverse overbite,
    mandibular protrusion, and open bite. The upper lateral incisors or upper canines may not be used for these
    measurements.

3. Dental ectopia include ectopic eruption such as when a portion of the distal root of the primary second molar is
    resorbed during the eruption of the first molar. These include transposed teeth. Also included are teeth in the
    maxillary sinus, in the ascending ramus of the mandible and other such situations, when teeth develop in other
    locations, rather than in the dental arches. These are classic textbook examples of ectopic eruption and
    development of teeth.

    In all other situations, teeth to be deemed ectopic must be more than 50% blocked out and clearly out of the
    dental arch. Regarding mutually blocked out teeth, only one will be counted.

Source: Parker WS. The HLD (CalMod) index and the index question. Am J Orthod Dentofacial Orthop. 1998 Aug;114(2):134-41.

The HLD(Md) Index is very similar to the original HLD Index; however, the scoring cutoff for constituting a handicap was raised from 13 to 15 points and the scoring formulas were modified by subtracting 2 mm from the overjet measurement and 3 mm from the overbite measurement.

Maryland Modification of the Handicapping Labio-Lingual Deviations [HLD(Md)] Index

1. Cleft palate (15) - Score no further if present

            Score 15

_____

2. Severe traumatic deviations (15) - Score no further if present

            Score 15

_____

3. Overjet in mm (Subtract 2 from measurement in mm)

_____

4. Overbite in mm (Subtract 3 from measurement in mm)

_____

5. Mandibular protrusion in mm

            x5

_____

6. Open bite in mm

            x4

_____

7. Ectopic eruption, each tooth (If anterior crowding is also present,
   score only the most severe condition. Do not score both conditions.)

            x3

_____

8. Anterior crowding: maxilla: ___   mandible: ___   (5 points for each
   arch when crowding exceeds 3.5 mm. If ectopic condition is also
   present, score only the most severe condition. Do not score both
   conditions.)

            Score 5 ea.

_____

9. Labio-lingual spread in mm (Measurement in mm of the
   distance from the most protruded to the lingually displaced
   anterior teeth. If there is only a protruded or lingually displaced
   tooth, measurement is taken from the incisor edge of that tooth
   to the normal arch line.)

_____

            TOTAL HLD(Md) SCORE

_____

A SCORE OF 15 and over constitutes a PHYSICAL HANDICAP.

Source: Han H, Davidson WM. A useful insight into 2 occlusal indexes: HLD(Md) and HLD(CalMod). Am J Orthod Dentofacial Orthop. 2001 Sep;120(3):247-53.

Federal Survey Modifications

None

References

References

Textbooks, Manuals, and the Internet:

Burt BA, Eklund SA. Dentistry, Dental Practice, and the Community, 5th edition. Philadelphia: W.B. Saunders Company, 1999.

Svirbely JR, Sriram MG. The Medical Algorithms Project. Retrieved September 14, 1999, from the World Wide Web: http://www.medal.org/index.html.

Journals:

Draker HL. Handicapping Labio-Lingual Deviations: A proposed index for public health purposes. Am J Orthodontics 1960;46:295-305.

Han H, Davidson WM. A useful insight into 2 occlusal indexes: HLD(Md) and HLD(CalMod). Am J Orthod Dentofacial Orthop. 2001 Sep;120(3):247-53.

Parker WS. The HLD (CalMod) index and the index question. Am J Orthod Dentofacial Orthop. 1998 Aug;114(2):134-41.

Younis JW, Vig KW, Rinchuse DJ, Weyant RJ. A validation study of three indexes of orthodontic treatment need in the United States. Community Dent Oral Epidemiol 1997 Oct;25(5):358-62.

Validaty

Beglin FM, Firestone AR, Vig KW, Beck FM, Kuthy RA, Wade D. A comparison of the reliability and validity of 3 occlusal indexes of orthodontic treatment need. Am J Orthod Dentofacial Orthop. 2001 Sep;120(3):240-6.

Younis JW, Vig KW, Rinchuse DJ, Weyant RJ. A validation study of three indexes of orthodontic treatment need in the United States. Community Dent Oral Epidemiol. 1997 Oct;25(5):358-62.

Reliability

Beglin FM, Firestone AR, Vig KW, Beck FM, Kuthy RA, Wade D. A comparison of the reliability and validity of 3 occlusal indexes of orthodontic treatment need. Am J Orthod Dentofacial Orthop. 2001 Sep;120(3):240-6.

Younis JW, Vig KW, Rinchuse DJ, Weyant RJ. A validation study of three indexes of

orthodontic treatment need in the United States. Community Dent Oral Epidemiol. 1997 Oct;25(5):358-62.

Listing of Publications with Surveys &

Surveys & Studies

United States Surveys & Studies:

Jenny J, Cons NC, Kohout FJ. Comparison of SASOC, a measure of dental aesthetics, with three orthodontic indices and orthodontist judgment. Community Dent Oral Epidemiol. 1983 Aug;11(4):236-41.

O'Leary TJ, Badell MC, Bloomer RS. Occlusal characteristics and tooth mobility in periodontally healthy young males classified orthodontically. J Periodontol. 1975 Sep;46(9):553-8.

Parker WS. Useful data from application of the HLD (CalMod) Index. Am J Orthod Dentofacial Orthop. 2000 Apr;117(4):435-7.

Parker WS. A study of 1000 malocclusions selected by the HLD (CalMod) Index. Am J Orthod Dentofacial Orthop. 1999 Apr;115(4):343-51.